

WHAT IS CLAIMED IS:

1. An implantable cardioverter-defibrillator for subcutaneous positioning between the third rib and the twelfth rib within a patient, the implantable cardioverter-defibrillator comprising:

5 a housing having a first surface and a second surface, wherein the first surface comprises an electrically insulated material and the second surface comprises an electrically conductive material; and

an electrical circuit located within the housing, wherein the electrical circuit is electrically coupled to the second surface of the housing.

2. The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a ceramic material.

3. The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a titanium alloy.

4. The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a stainless steel alloy.

5. The implantable cardioverter-defibrillator of claim 1, wherein the first surface comprises a polymeric material.

6. The implantable cardioverter-defibrillator of claim 5, wherein the plastic material is selected from the group consisting essentially of a polyurethane, a polyamide, a polyetheretherketone (PEEK), a polyether block amide (PEBA), a polytetrafluoroethylene (PTFE), a silicone, and mixtures thereof.

7. The implantable cardioverter-defibrillator of claim 1, wherein the first surface is pliable.

8. The implantable cardioverter-defibrillator of claim 1, wherein the housing comprises a material that can be sterilized.

9. The implantable cardioverter-defibrillator of claim 1, wherein the second surface can emit an energy for shocking the patient's heart.

10. The implantable cardioverter-defibrillator of claim 9, wherein the second surface can further receive sensory information.

5 11. The implantable cardioverter-defibrillator of claim 1, wherein the second surface can receive sensory information.

12. The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit can provide a cardioversion-defibrillation energy to the patient's heart.

13. The implantable cardioverter-defibrillator of claim 12, wherein the electrical circuit can further provide multiphasic waveform cardiac pacing for the patient's heart.

14. The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit can provide multiphasic waveform cardiac pacing for the patient's heart.

20 15. The implantable cardioverter-defibrillator of claim 14, wherein the electrical circuit can provide biphasic waveform cardiac pacing for the patient's heart.

16. The implantable cardioverter-defibrillator of claim 14, wherein the electrical circuit can provide triphasic waveform cardiac pacing for the patient's heart.

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17. The implantable cardioverter-defibrillator of claim 1, wherein the electrical circuit can provide a monophasic waveform cardiac pacing for the patient's heart.

18. The implantable cardioverter-defibrillator of claim 1, wherein the housing further comprises a connection port that electrically couples to the electrical circuit.

19. The implantable cardioverter-defibrillator of claim 18, wherein the connection port is further coupled to a lead.

20. The implantable cardioverter-defibrillator of claim 19, wherein the lead is a pacing lead.

20 21. The implantable cardioverter-defibrillator of claim 19, wherein the lead is a shocking lead.

22. The implantable cardioverter-defibrillator of claim 19, wherein the lead is a sensory lead.

23. A subcutaneous cardioverter-defibrillator comprising:

5 a housing having a proximal end and a distal end, wherein at least a portion of the housing is electrically insulated;

a cardioversion-defibrillation circuitry sealed within the housing, wherein the cardioversion-defibrillation circuitry can provide an anti-arrhythmia waveform; and

10 an electrically conductive surface disposed upon a portion of the housing, wherein the electrically conductive surface couples to the cardioversion-defibrillation circuitry, and further wherein the electrically conductive surface can provide a cardioversion energy of approximately 5 V/cm to approximately 90 percent of a patient's myocardium.

24. The subcutaneous cardioverter-defibrillator of claim 23, wherein the housing is pliable.

20 25. The subcutaneous cardioverter-defibrillator of claim 23, wherein the housing comprises a material that can be sterilized.

26. The subcutaneous cardioverter-defibrillator of claim 23, wherein the length between the proximal end of the housing and the distal end of the housing is approximately 3 centimeters to approximately 30 centimeters.

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27. The subcutaneous cardioverter-defibrillator of claim 23, wherein the proximal end of the housing and the distal end of the housing are substantially square.

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28. The subcutaneous cardioverter-defibrillator of claim 23, wherein the distal end of the housing is rounded.

29. The subcutaneous cardioverter-defibrillator of claim 28, wherein the proximal end of the housing is rounded.

30. The subcutaneous cardioverter-defibrillator of claim 28, wherein the proximal end of the housing is substantially square.

31. The subcutaneous cardioverter-defibrillator of claim 23, wherein the width of the housing is approximately 1 centimeter to approximately 10 centimeters.

32. The subcutaneous cardioverter-defibrillator of claim 23, wherein the width of the housing is approximately 2 centimeters to approximately 5 centimeters.

33. The subcutaneous cardioverter-defibrillator of claim 23, wherein the width of the housing tapers inwardly from the proximal end of the housing to the distal end of the housing.

34. The subcutaneous cardioverter-defibrillator of claim 23, wherein the depth of the housing decreases from the proximal end of the housing to the distal end of the housing.

35. The subcutaneous cardioverter-defibrillator of claim 23, wherein the electrically conductive surface may additionally receive sensory information.

36. The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a multiphasic waveform for cardiac pacing of a patient's heart.

37. The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a biphasic waveform for cardiac pacing of a patient's heart.

5 38. The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a triphasic waveform for cardiac pacing of a patient's heart.

39. The subcutaneous cardioverter-defibrillator of claim 23, wherein the cardioversion-defibrillation circuitry can provide a monophasic waveform for cardiac pacing of a patient's heart.

40. The subcutaneous cardioverter-defibrillator of claim 23, wherein the housing further comprises a connection port that electrically couples to the cardioversion-defibrillation circuitry.

41. The subcutaneous cardioverter-defibrillator of claim 40, wherein the connection port is further coupled to a lead.

42. The subcutaneous cardioverter-defibrillator of claim 41, wherein the lead is a pacing lead.



43. The subcutaneous cardioverter-defibrillator of claim 41,  
wherein the lead is a shocking lead.

5 44. The subcutaneous cardioverter-defibrillator of claim 41,  
wherein the lead is a sensory lead.

45. A cardioverter-defibrillator for subcutaneous implantation,  
the cardioverter-defibrillator comprising:

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a housing having a length, a width and a depth, wherein the  
depth of the housing is less than approximately 15 millimeters,  
the housing further including a first end and a second end;

an electrical circuit disposed within the housing, wherein  
the electrical circuit can provide cardioversion-defibrillation  
and cardiac pacing for a patient's heart; and

an electrode located on the housing, wherein the electrode  
is electrically coupled to the electrical circuit.

20 46. The cardioverter-defibrillator of claim 45, wherein at  
least a portion of the housing comprises an electrically  
insulated material.

47. The cardioverter-defibrillator of claim 42, wherein at least a portion of the housing comprises an electrically nonconductive material.

5 48. The cardioverter-defibrillator of claim 45, wherein the width of the housing between the first end and the second end are substantially similar.

10 49. The cardioverter-defibrillator of claim 45, wherein the housing is approximately 1 centimeter to approximately 10 centimeters wide.

15 50. The cardioverter-defibrillator of claim 45, wherein the housing is approximately 2 centimeters to approximately 5 centimeters wide.

51. The cardioverter-defibrillator of claim 45, wherein the length of the housing is greater than the width of the housing.

20 52. The cardioverter-defibrillator of claim 45, wherein the length of the housing is substantially similar to the width of the housing.

53. The cardioverter-defibrillator of claim 45, wherein the housing is approximately 3 centimeters to approximately 30 centimeters in length.

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54. The cardioverter-defibrillator of claim 45, wherein the housing is approximately 5 centimeters to approximately 20 centimeters in length.

55. The cardioverter-defibrillator of claim 45, wherein the first end of the housing is rounded.

56. The cardioverter-defibrillator of claim 55, wherein the second end of the housing is substantially square.

57. The cardioverter-defibrillator of claim 55, wherein the second end of the housing is rounded.

58. The cardioverter-defibrillator of claim 45, wherein the width of the housing tapers inwardly between the second end of the housing and the first end of the housing.

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59. The cardioverter-defibrillator of claim 45, wherein the depth of the housing decreases from the second end of the housing to the first end of the housing.

60. The cardioverter-defibrillator of claim 45, wherein the electrode is located on a portion of the first end of the housing.

61. The cardioverter-defibrillator of claim 60, further comprising a second electrode being electrically coupled to the electrical circuit within the housing.

62. The cardioverter-defibrillator of claim 61, wherein the second electrode is located upon a portion of the second end of the housing.

63. The cardioverter-defibrillator of claim 45, wherein the housing further comprises a connection port that is electrically coupled to the electrical circuit.

64. The cardioverter-defibrillator of claim 63, wherein the connection port couples to a lead.

65. The cardioverter-defibrillator of claim 64, wherein the lead is a pacing lead.

5 66. The cardioverter-defibrillator of claim 64, wherein the lead is a shocking lead.

67. The cardioverter-defibrillator of claim 64, wherein the lead is a sensory lead.

68. The cardioverter-defibrillator of claim 63, wherein the connection port is located on a portion of the first end of the housing.

69. The cardioverter-defibrillator of claim 63, wherein the connection port is located on the first end and the second end of the outer surface housing.

70. A cardioverter-defibrillator for subcutaneous implantation,  
20 the cardioverter-defibrillator comprising:

a housing having a length, a width and a depth, wherein the depth of the housing is less than about 15 millimeters, the

housing further including a first end, a second end and a connecting member disposed therebetween;

an electrical circuit disposed within the housing, wherein the electrical can provide cardioversion-defibrillation and cardiac pacing for a patient's heart; and

an electrode located on the housing, wherein the electrode is electrically coupled to the electrical circuit.

71. The cardioverter-defibrillator of claim 70, wherein the width of the housing between the first end, the second end and the connecting member are substantially similar.

72. The cardioverter-defibrillator of claim 70, wherein the width of the first end of the housing and the width of the second end of the housing are greater than the width of the connecting member located therebetween.

73. The cardioverter-defibrillator of claim 70, wherein the connecting member is approximately 1 centimeter to approximately 20 centimeters in length.

74. The cardioverter-defibrillator of claim 70, wherein the electrode is located on a portion of the first end of the housing.

5 75. The cardioverter-defibrillator of claim 74, further comprising a second electrode being electrically coupled to the electrical circuit within the housing.

76. The cardioverter-defibrillator of claim 74, wherein the second electrode is located upon a portion of the second end of the housing.

77. A cardioverter-defibrillator for subcutaneous positioning between the third rib and the seventh rib within a patient, the cardioverter-defibrillator comprising:

a housing having a top surface and a bottom surface defining a cavity therein;

a cardioversion-defibrillation circuitry encased within the cavity of the housing; and

20 an electrically conductive surface disposed upon a portion of the bottom surface of the canister housing, wherein the

electrically conductive surface is connected to the  
cardioversion-defibrillation circuitry.

78. The cardioverter-defibrillator of claim 77, wherein the  
5 housing comprises an electrically insulated material.

79. The cardioverter-defibrillator of claim 77, wherein the  
housing comprises an electrically nonconductive material.

80. The cardioverter-defibrillator of claim 77, wherein the top  
surface of the housing is substantially smooth.

81. The cardioverter-defibrillator of claim 77, wherein the  
length of the bottom is greater than the length of the top  
surface.

82. The cardioverter-defibrillator of claim 77, wherein the top  
surface and the bottom surface are substantially planar.

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